Oroville FERC Relicensing (Project No. 2100)

SP-F21 Task 3 Final Report

Project Effects on Predation of Feather River Juvenile Anadromous Salmonids

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Study Objectives

- Identify and categorize the potential effects of project operations and associated artificial structures on the level of predation on juvenile anadromous salmonids within the study area.

Need for Study

- Project operations and associated artificial structures may influence the level of predation on ESA listed anadromous salmonids

Methodology

- Review literature investigating predation on juvenile anadromous salmonids associated with hydropower facilities
- Determine applicability of reviewed literature to Oroville project operations and associated artificial structures

Results

- Project Structures
  - Fish Barrier Dam
    - Migration barrier creating high concentrations of spawning habitat utilization
    - Plunge pool at base of dam
  - Feather River Fish Hatchery
    - Water Temperatures
    - Fish release

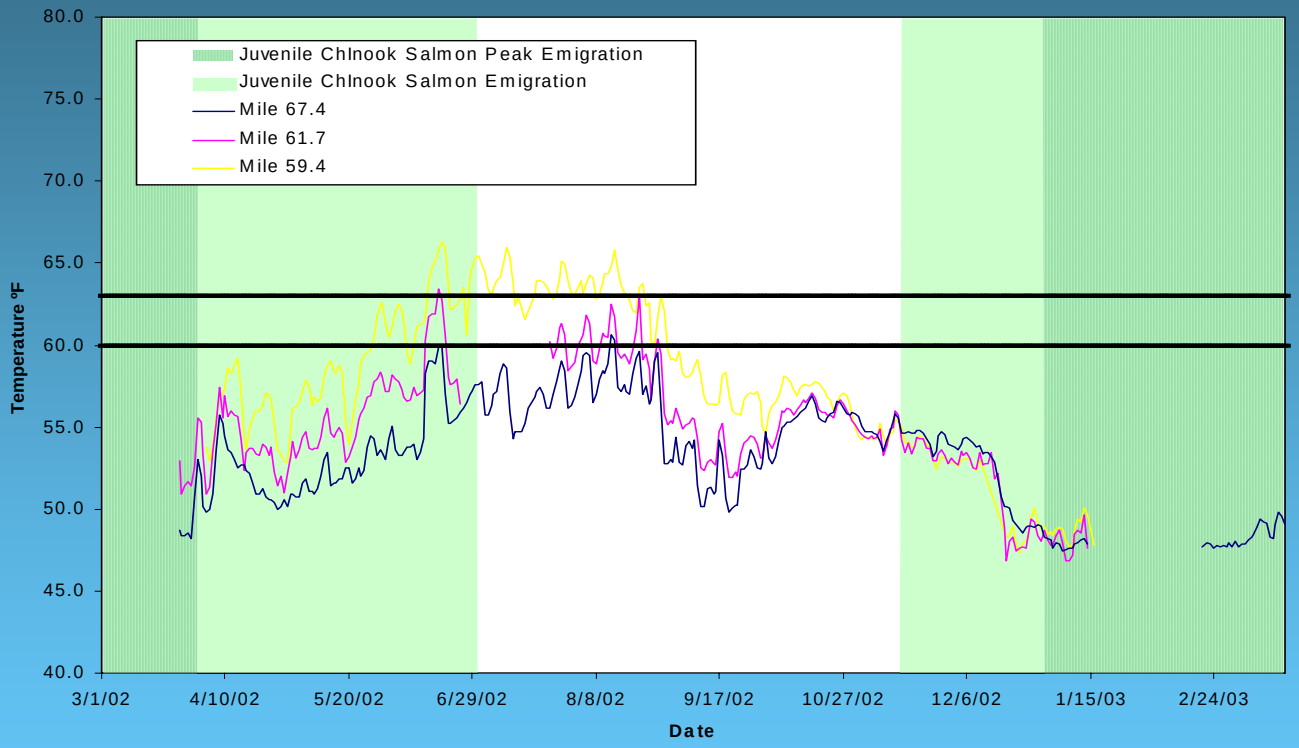
Results

- Project Structures
  - Low Flow vs. High Flow Channel
    - Different flow regimes
  - Thermalito Afterbay Outlet
    - Plunge pool
      - Potential site for active predation
    - Turbulence during high flow events
      - Potentially leading to disorientation of juvenile salmonids
    - Warm water inflow

Results

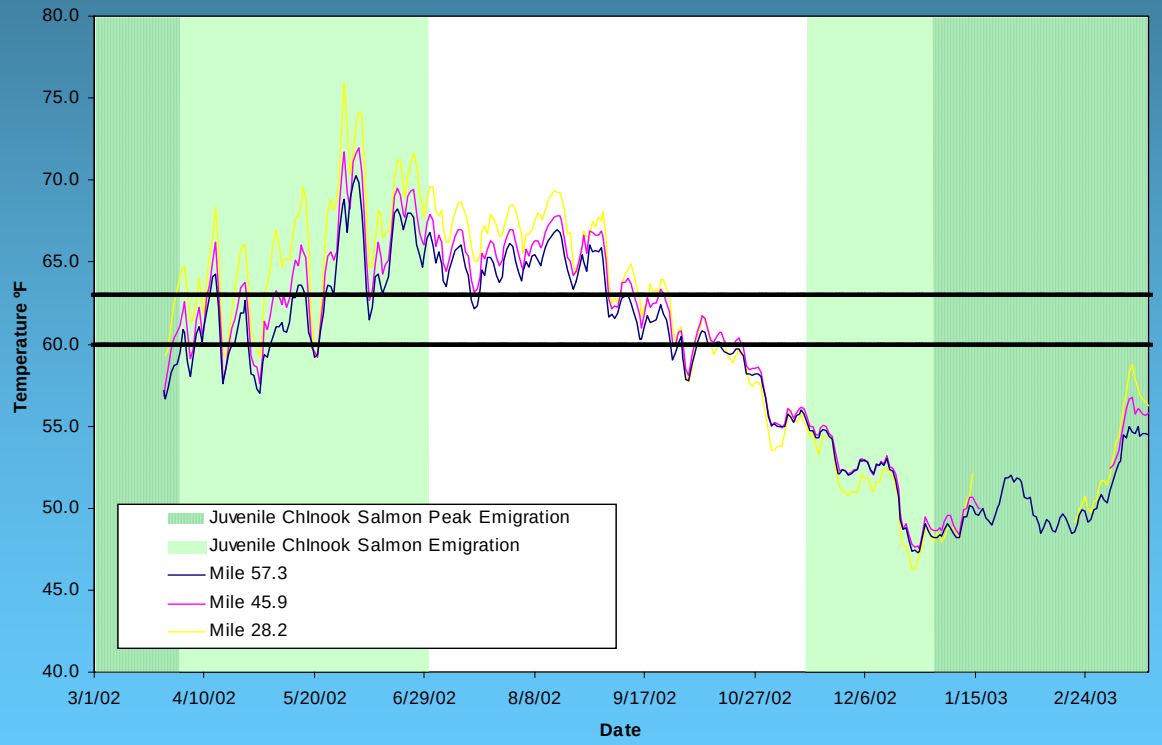
- Predatory Species
  - Sacramento Pikeminnow
  - Steelhead Trout
  - Striped Bass
  - Largemouth Bass
  - Smallmouth Bass

Results



Water Temperatures in Low Flow Channel
63°F = "increase in Chinook salmon Predation by pikeminnow"
60°F = "Prey consumption rates by pikeminnow very low below 60°F".

Results



Water Temperatures in High Flow Channel

Conclusions

- Limited juvenile rearing habitat – given current level of spawning activity
  - High concentrations of juveniles
  - Early out-migration of juveniles

Conclusions

- Water Temperatures
  - Not conducive to high predation rates given current predator species composition
- Recent Studies
  - High numbers of juvenile out-migrants
  - High spawning escapements

Conclusions

- It does not appear likely that continued operation of the Oroville Facilities, under current operating conditions, would create conditions favoring unnaturally high predation rates on juvenile anadromous salmonids in the lower Feather River